to a loss of thirty to thirty five percent of the prime agricultural land and pastures, either by abandoning or by degradation of the land.

Some of this land loss is also due to uncontrolled urban developments and sprawl, e.g., the farmlands in the province of Kabul have been lost in result of urban developments. This led to a drastic change of the previously dominating climatic and environmental factors in the area, even conceivable to any one who has been living in Kabul thirty years ago. Unfortunately, this kind of land degradation seems to be permanent and not easily reversible, if at all.

Of the remaining area, about half (57 million ha) is rangeland and open *Artimesia* steppe used for extensive livestock grazing. Most of these lands were heavily overgrazed, resulting in extensive degradation and soil erosion. Some of these lands that are closer to towns or militarily strategic locations are also partially contaminated by land mines. As a result, especially in the past few years of drought, hundreds of thousands of nomads and semi-nomads that rely on these pasturelands were severely hit by the consequences of this environmental degradation, causing mass migrations of the affected people towards urban centres in the provinces of Herat and Mazare-Sharif, and raised serious humanitarian concerns (Cohn, 2001).

2.4. Water Resources:

Water is key to the health and welfare of people in Afghanistan, and essential to maintain agricultural productivity, which is the heart of the Afghan economy. Water resources in Afghanistan include surface water resources such as rivers and lakes, and groundwater aquifers. Koh-e-Baba mountain range, which covers the central regions, is forming the primary watershed of the country.

In Afghanistan, rivers are the main surface water resources of the country. The Amu Darya is the major river of Afghanistan, which traverses a large area of Central Asia to dry up before it reaches the Aral Sea. The Murghab and the Hari-Rud both drain the northwest sector of the Hindu Kush, flowing west then north to terminate in southern Turkmenistan, where they contribute to groundwater resources. The Helmand, which collects rain and snowmelt from the southern slopes of the Hindu Kush, is the longest river entirely within Afghanistan, with its catchments area extending over some 31 per cent of the country surface area. The Helmand flows through the arid southwest plains to enter the marshlands and lakes of the Sistan basin. The Kabul River system, which drains around 9 per cent of the country around the capital, traverses the Jalalabad Gorge to join the Indus River in Pakistan.

With the exception of the Amu Darya, which receives some inputs from countries to the north, most rivers in Afghanistan, and almost the entire supply of the country's water for irrigation, drinking, and maintenance of wetland ecosystems are derived from rainfall within the country's own borders and the seasonal melting of snow and permanent ice fields in the mountains. The persistence of snow and ice are closely related to prevailing temperature, so this source of water is likely to be at risk from continuing global warming. In general, the peak flow of melt-water occurs in springtime, and flow is sporadic or non-existent in many watercourses during the

summer. In years with heavy precipitation, rapid runoff can cause flooding and mudslides in the spring.

There are very few lakes and wetland areas. Wetlands in Afghanistan are particularly valuable for people as sources of water and other resources such as reeds, and as habitat for wetland species. The largest permanent lakes are those at Band-e-Amir in the province of Bamiyan, and at high altitudes in the Wakhan Corridor. Other lakes are more variable in extent. By far the largest of these lie within the Sistan basin, covering up to 4000 km2, in times of good water supply. Dasht-e-Nawar and Ab-e-Estada in the province of Ghazni, and Kole Hashmat Khan in the outskirt of the Kabul city are other important wetland areas of the country.

Currently, Afghanistan uses less than one-third of its potential 75000 million m3 of surface water resources (FAO, 1997). The extent, potential and limits of groundwater resources of Afghanistan have not been studied adequately. Regional differences in supply, inefficient use, and wastage mean that a major part of the country experiences water scarcity. This scarcity is particularly exacerbated in the recent years of drought, and the prevalent uncoordinated local water management schemes in the country.

III. The Current State of Environment in Afghanistan

3.1. Degradation of Land Resources:

Afghanistan is a traditional agrarian society, with rural Afghans constituting some 80 percent of the population. The Afghan peasants, almost all of them poor, depend directly on what they can grow, and are particularly vulnerable to degradation of the land resources. Agricultural sector in this country is and will remain a critical component of economic growth and human development. However, in its current structure and capacity, this sector is inefficient, and creates more environmental problems than it pays for.

The dramatic decrease in agricultural outputs of Afghanistan in the past three decades could be a reflection of the overall degradation of its land resources. Compared to that of 1979, agricultural output has dramatically decreased over the years, by up to fifty percent during the years of Soviet war (U.S. Bureau of the Census, 1988). To compensate this loss, rural people overexploited the free and deregulated natural resources of their environment, resulted in severe degradation of the land resources of the country. Upon the sharp decline in land productivity, the poor farmers sought cultivation of opium as an alternative, which was also encouraged by the Afghan Narco-Warlord Circles and international growing drug markets. This in turn further degraded the agricultural land, including that of the very fertile Helmand and Kandahar farmlands.

With the loss of forests and vegetation, and excessive grazing and dry land cultivation, soils are being exposed to serious erosion from wind and rain. The productivity of the land base is declining, driving people from rural to urban areas in search of food and employment. Riverbanks are also eroding with the loss of stabilizing vegetation, and flood risks are increasing. However, it is very difficult to provide an accurate account of how many percent of the land surface of the country faces problems of soil erosion, but generally, it is not hard to understand that due to the

nature of the topography of the landscape, the arid climate, and barren lands of Afghanistan, probably more than 90 per cent of the surface land could be subject to soil erosion based on the following reasons:

1. The land in this territory has been severely folded by tectonic movements and the landforms are characterized by steep slopes and deep valleys (Tapponnier, et. al., 1981).
2. Rainfall pattern all over the country is mostly variable from year to year, and periods of heavy rain sweep away the porous, silty, friable loess soil, that is common in most parts of the country (Shareq, et.al., 1980), and is easily broken down.
3. Furthermore, the careless and ill-considered use of land and the areas of open land for growing crops, reclamation on steep slopes and overexploitation of the vegetation cover for fuelwood, all leave the fragile soils exposed to the action of wind and water to cause serious soil erosion.

In the arid and semi-arid Afghanistan, there are several provinces and regions especially to the west and south-west of the country that are influenced by the gradual desiccation of the environment, loss of vegetation and consequently humus in the soil, resulting in a looser, sandier soil structure, and ever more arid conditions. Here, in some cases, desertification is caused either by abandoning the fragile lands that need to be frequently cared for, while ironically in other cases through reclamation, overgrazing and the destruction of vegetation for use as fuelwood, a trend that is getting ever stronger.

In southwestern regions of Afghanistan, the notorious 'wind of 120 days', which blows from the northwest between May and September, scours the landscape, driving banks of mobile sand and adding to instability in the drainage network. Without a stable source of water, much of the natural vegetation of these regions has died or been collected for fuelwood, further contributing to soil erosion and significant movement of sand onto the irrigated areas. In 2002, up to 100 villages in this region have been submerged by windblown dust and sand (Partow, 2003) to be followed by sandstorms of 2003 that buried 57 villages in the province of Farah, affecting more than 12000 people, and had left hundreds of people homeless, destroyed crops and contaminated water supplies (IRIN, 2003). This disaster was described as the worst sandstorms in living memory of the people in this part of Afghanistan.

Due to the degradation of the grassland, the grasses became shorter and sparser, and the overall biological productivity is reduced and the quality of the grasses deteriorated (Hasanyar, 2000). All these adversely affect the livestock, and create dramatic changes in the patterns of wildlife populations, and disturb the balance of the sensitive mountain grassland ecosystems of Afghanistan. Persistent drought and poor grazing since 1999 has led to a massive reduction in flock numbers, possibly by as much as 70 per cent (World Bank, 1999) and many *kuchi* families who have lost all their livestock have been forced to become environmental refugees or move into camps for internally displaced people close to feeding centers.

In places that the availability of the irrigation water has been reduced, the requirement of watering has substantially increased due to increased deposits of salts on topsoil, resulted in salinization of

the soil, e.g., the Helmand Wadi experiences such an effect (Saba, 2001).

The worst nightmare of the Afghans working on their fields or taking their livestock to grazing lands is the presence of landmines. The presence of more than ten million land mines in the country makes it the world's most deadly minefield. According to a survey conducted by CIET-International in 37 Afghan communities in 1994, 12% of all households surveyed affected by landmines (Anderson, et al., 1995). In three years, from 1997-2000, three thousand Afghans are either killed or maimed by mines and unexploded ordinances (York, 2001). The degradation of farmland and pastures by land mines and UXO have forced millions of farmers and nomads to abandon their traditional agrarian activities. The burden of land mines is especially heavy for nomads, who for thousands of years have adopted and developed a peculiar way of life suitable in this terrain; and now suddenly they are facing a change in their habitat and environment, a tragedy that seems to put an end to their natural livelihood and unique culture.

Many farmlands and orchards were burnt and degraded by heavy war machinery and chemical residues during the war. From 35 thousand villages, 26 thousands were destroyed and the rest were damaged during the Afghan-Soviet war (Afghan Government Statistics, 1994). This did not end there, e.g. in 1999, the Shomali valley, which is the most fertile region close to the capital Kabul, has witnessed a mass burning of crops and mulberry trees by Taliban. More than three hundred thousand people from this area were forcefully evacuated from their residences, while they were preparing for their fall harvest.

In major urban centres such as Kabul, Herat, Kandahar and Mazare-Sharif, the expansion of urban developments are constantly eating up the most fertile lands that once were feeding these cities. It is ironic that historically, these cities have been established here because of the fertile land itself. Now, green fields are disappearing from the view by the passage of each day, a process that if not stopped, will irreversibly degrade and destroy the fragile and limited agricultural lands of Afghanistan. The greatest damage has been done to the agricultural lands in the outskirts of Kabul city. The once extremely beautiful and fertile farmlands of Deh-Sabz and Char-Dehi districts have been considerably eaten up by residential developments. Historically, these areas provided fresh produce for the whole region of Kabul.

Wetlands in the Kabul area were also drained. Wetlands of Kabul were always been the most important factors in normalizing the dry climate of this region and feeding the groundwater systems of the area. At present, the once beautiful wetlands of the Kole-Hashmat Khan and its vicinity have become the dirtiest biochemical dumping grounds that holds enormous amounts of chemical and biological pollutants from the skin processing mills in the area. Kole Hashmat Khan wetland that has functioned as a halting ground for the graceful Siberian cranes on their annual migration rout to the Indian subcontinent and a recreational hunting and fishing ground for the Kabul residents is no longer a place that one could go for a leisurely walk.

As rural refugees are returning, numerous problems of land ownership and adequacy of arable land will also arise, a condition that will induce more stress on the already scarce land resources of the county. This requires thorough understanding of the ecosystems and land management

practices to avoid further degradation of the existing land resources.

Increasing the levels of human development in our society is directly connected to our ability to adapt new technologies and innovations to our needs. Restoration of forests and other vegetation cover combined with grazing management are high priorities to combat erosion, desertification and flood risks. Modernizing the production conditions and social relations in rural areas by incorporating the farmers to the market through reorientation of production from subsistence models to market-oriented approaches will also help us overcome some of our environmental problems pertaining to degradation of land resources of the country.

3.2. Land Degradation in the Framework of HD:

In the longer term, the effects of the degradation of natural systems in Afghanistan are a serious threat to the human security of the country, for it further impoverish millions of people and undermines the very basis of human development. Land degradation is also much harder to reverse, comparing to the phenomenon of say pollution. It is much easier to provide clean water, or to clean up a dangerous waste dump, than it is to restore a piece of severely degraded land.

In rural Afghanistan, presently the income of the peasantry is in decline, as they face a reduction in their farming area due to continuous droughts, soil erosion, and land degradation, as well as an unfair market for their produce. In par with this, the survival strategy of these people basically consists in over-exploiting some of their ecological assets in order to compensate the shortage of some others. This sharp decline in agricultural productivity and it ensuing survival strategy typically initiates a vicious circle of impoverishment, but it can also be the bases of a virtuous circle to get rid of poverty, a circle that shall be stimulated by public policy (Ul Haq, 1995).

The present trend of managing land resources in Afghanistan is leading to a full-fledged crisis in land availability and access, and requires some sort of intervention, because the traditional methods of managing the ecologically sensitive soils are being edged out as more and more good and fertile lands are used for poppy cultivation, and urban sprawl.

For Afghanistan to secure sufficient food for everyone, it has to adopt and implement an adequate national policy for sustainable agriculture. Such a policy must give priority to increasing food production, with as much emphasis as possible on traditional and organic agriculture, which is sustainable, while at the same time demands little energy, capital or other inputs, and having the potential of higher monetary and nutritional outputs. In this context, two general policy objectives could address the issues of poverty and environmental degradation in relation to land resources and agriculture (Scherr, 1999):

1. To improve the well-being of the poor by improving the quality, quantity, productivity and value of the natural resource essential to their livelihoods; and
2. To improve the environmental externalities associated with resource use and management by the poor.

Many social and institutional factors, such as a good policy framework, better physical

infrastructure in rural areas, a secure land tenure system, and a policy of improvement upon indigenous technology may facilitate the agricultural changes and reforms that human development in Afghanistan requires. Issues such as inefficient access to land, insufficient working capital and unfair markets are also serious problems for rural Afghanistan, which have to be addressed through new policies.

3.3. Deforestation and its Effects on the Livelihoods of People:

There are generally three distinct types of tree covers in Afghanistan: forests of mixed oak and conifers, open woodlands, and riparian forest. Tree cover tends naturally to be more continuous along the eastern border with Pakistan, where precipitation is far higher than elsewhere, more evenly distributed through the year and less erratic. The mixed oak and coniferous forests of the east have potential to be managed as sources of timber, but are now being logged illegally, severely reducing the country's natural resource base. Over most of the center and north of the country, conditions for tree growth are more marginal, and existing tree cover is extremely sensitive to disturbances that may then lead to erosion and desertification.

Assessing the incomplete evidence available to them in the late 1970s, FAO concluded that most of north, central and eastern Afghanistan was wooded until early in the 19th century (FAO, 1981). Estimates at that time suggested that almost 1 million ha of oak forest existed, and about 2 million hectares of coniferous forest, mainly pine and cedar. In total these forests amounted to some 4.5 per cent of the land area. Various types of open woodland, with pistachio, juniper and other species, covered about 32 million ha, or 48 per cent of the land area (FAO, 1981). A 1993 estimate by FAO (1993) suggested that forest cover in the east had decreased by 16 per cent to about 12000 km2 since the 1970s, a loss of some 2300 km2.

Analysis of landsat satellite images covering the provinces of Nuristan, Kunar and Nangarhar for 1977 and 2002 revealed that forest cover has decreased by a total of 52 per cent when the provinces are taken together. Nengarhar province has been the hardest hit, with a 71 per cent decrease in forest cover. Meanwhile, forest cover in Nuristan has decreased by 53 per cent, and Kunar by 29 per cent. Residents predict similar losses for the forested regions in the provinces of Paktya, Khost and Paktika (UNEP, 2003). UNEP's satellite analyses revealed that conifer forests in the provinces of Nangarhar, Kunar and Nuristan have been reduced by an average of 50 per cent since 1978. A major factor in this destructive process is the illegal logging and clear-cuttings of these forests by timber smugglers in cooperation with local warlords. Between 1995 and 1996, two and half million cubic feet of lumber have been smuggled from Afghanistan over the border and sold in Pakistan with permission from the Pakistani Government of the time. However, the unofficial numbers for the amount of lumber smuggled into Pakistan from Afghanistan is estimated to be much higher than this (Jang, 1997).

Forest officers in Badghis and Takhar provinces indicated to the UNEP investigators that 50–70 per cent of pistachio woodland cover had been lost over the past three decades. UNEP (2003) conducted satellite-image analyses in both provinces to determine how the distribution of woodlands had changed between 1977 and 2002. In 1977 woodlands were detected on 55 per cent of the land base in Badghis and on 37 per cent in Takhar. The density of woodlands ranged from

40 to 100 trees per hectare. In 2002 the density of woodlands had decreased in both provinces to the point where they could no longer be detected by satellite instruments. This either suggests complete deforestation, or a reduction in density to less than 40 trees per hectare. It was estimated that 50 per cent of the juniper cover in the Subzac pass has been lost in the last 30 years. Local sources at Kushka Kuhna in Badghis province confirmed that as much as 80 per cent of juniper woodland had been cut during the past two decades.

In the 1970s, dried fruits, raisins and nuts contributed more than 40 per cent of the country's foreign exchange earnings, although the years of conflict have meant that the country has lost some of its former market niches. Prior to the outbreak of war in 1978, wild pistachio nut was one of the major export items in the Afghan economy, covering 4700 hectares of harvest area with production of 3800 metric ton, which is reduced to a harvest area of 2700 hectares with production of 1600 metric ton in 1999 (FAOSTAT, 1999). The rapid expansion of orchard plantations and the adoption of modern systems and varieties occurred between 1989 and 1999, however this trend is slowed down by drought (UNEP, 2003).

In the context of natural systems of Afghanistan, forests do wonderful things. They bind soil to the ground, regulate water supplies and help in moderating the harsh climate of this country. Sadly, illegal harvesting is depleting forests and woodland resources, and widespread grazing is preventing regeneration, and seriously impairs these attributes. Millions of people downstream the Afghan rivers in Iran, Pakistan, as well as central Asian countries depend on water absorbed by the forests of the Hindu Kush and Solaiman mountain ranges. When these forests have been cut, rainwater sheets off the land, first causing floods, then drought. Presently, tens of thousands of hectares of land, especially in the east and southeastern watersheds of the country, are becoming more vulnerable to flooding as a result of deforestation in these areas, affecting the livelihoods of millions of people, particularly that of the poor population.

For example, in 1997, in the province of Faryab, more than twenty lives have been lost to sudden floods, 600 houses were destroyed and more than seven thousand acres of farmland have been stripped of the fertile soil cover and 1900 cattle were washed away. In the same year, thousands of acres of farmland have been flooded and destroyed in the Herat valley in western Afghanistan (Johnston, 1997). Over the years, deforestation in high altitudes increased the avalanche incidents killing many villagers; e.g., in the Salang valley in 1997, more than eighty life have been lost to avalanches directly resulted from the cutting of the slopes' vegetation (Saba, 2001). In early June 2003, flooding killed 11 people and affected more than 2,000 people in the north and northeast province of Afghanistan (DPA, 2003).

In another flooding episode in July 2003, as many as 24 people were killed and hundreds of mud homes and vast tracts of agricultural land were washed away in the provinces of Paktia, Paktika, Khost and Logar as a direct result of deforestation. At least seven people, including two children were killed, and 50 head of cattle and 70 houses destroyed and 100 hectares of agricultural land damaged due to a flood in Mohammad Agha district of the Logar province. The casualties in Khost province occurred when mountain streams, swollen by the relentless rains, washed away mud homes in Spera district (Jang, 2003).

Forests in Afghanistan occupy very fragile ecosystems, and once lost, may never be restored. Given that a strong relationship between poverty and forests is already established (PEI, 1999), deforestation has significant human costs for Afghanistan. Forests have been a major source of food, fodder, fuel, timber, dyes, and medicine for tens of thousands of poor people. Uncontrolled and illegal cutting of these national resources at the hand of few at such a fast rate rob thousands of these poor people of their livelihoods.

It is suggested that participatory policy in the management of forest resources of Afghanistan, and intensive reforestation efforts must be adopted at community levels all over the country. Research shows that adequate incentives and the recognition of community basic tenure rights can increase productivity while at the same time improve protection of forest resources (CNHDR, 2002). Such measures in Afghanistan may slow deforestation so that forests may regenerate and thrive again in the lives and livelihoods of poor people of this country.

3.4. Loss of Biodiversity Constrains the Scope of Human Development:
Biodiversity refers to diversity of species of life forms. It is an important factor in determining the quality of the health and sustainability of the environment. More important, it is the means of livelihood and the means of production, particularly for poor people who have no access to other assets and productive resources. For food and medicine, for energy and craft, poor people depend on the wealth of biological resources and their knowledge of a diverse biosphere that they are part of it. Biodiversity helps poor people survive in times of scarcity, as demonstrated during the recent years of drought in the province of Badghis in northwestern Afghanistan, where people had to use wild plants as the only source of food for survival (UNICEF, 2002).

Afghanistan has a fairly diverse range of ecosystems, including glaciers and high-alpine vegetation in the extreme northeast, montane coniferous and mixed forest, open dry woodland with juniper, pistachio or almond, semi-desert scrub, sand and stony deserts, rivers, lakes and marshland. Afghanistan's ecosystem diversity comprises a variety of biotopes including forest, scrubland, meadow, steppe, savannah, desert, tundra, marsh, rivers, and lakes. The legal status of all protected areas of these ecosystems in Afghanistan is currently in question, and no management is taking place to protect and conserve their ecological integrity and wildlife. Furthermore, less than one per cent of the land is contained within the current protected areas, none of which cover the conifer forests of the east. Only the Band-e-Amir National Park, one of the most beautiful landscapes in all of Afghanistan, is in good hydrological condition despite the recent drought (UNEP, 2003).

Loss of biodiversity in Afghanistan is a consequence of severely degraded environment. The dominating causes of biodiversity losses are biotope destruction, overexploitation of wildlife resources, and wildlife trade, deforestation, soil erosion, desertification, air pollution, dust storms, agricultural degradation, primitive local industry, and steady drainage of sensitive montane wetlands in the quest for more fertile arable land, have severely disturbed the natural environment of the wild animals and plants, including many endemic species that are not recorded yet.

Furthermore, Afghanistan has a culture in which the collection of plants, the trapping of birds for

the caged bird trade, and the hunting of birds and animals are unregulated, resulting in excessive removal and even in some cases in extermination of the animal and plant species. Animal skins, including those of internationally protected or endangered species such as snow leopard, fox and jackal are traded daily in local markets. Trade in birds of prey such as falcons is still a common practice, which endangers the overall existence of some of these species, endemic to the Hindu Kush. Hunting remains unregulated and mismanaged. Unregulated uprooting of some species of plants by root traders is a serious threat to the endemic plants of the country.

The freshwater fishes of Afghanistan have been little studied, but many are believed to be endemic. Using explosive for fishing or so-called dynamite fishing, and electrifying fish colonies are popular fishing methods. This not only endangers the population of the endemic fish species of the mountain water streams, but also threatens the life and the existence of many other species of animals that live in or around the waters. All these activities together contribute to the sharp decline in the numbers of animals and plants and a contraction in their ranges, with the result that a disturbing number should be listed at the level of endangered species. Some wild plants that have commercial value are over exploited and disappearing in a fast rate, and if not protected, may become extinct.

Loss of biodiversity threatens the natural wildlife heritage of the country. For example, flamingos have not bred successfully in Afghanistan for four years, and the last Siberian crane was seen in 1986. While the Wakhan Corridor contains healthy populations of endangered snow leopards and other mammals including Marco Polo sheep, active and unregulated hunting is occurring in many regions of the country, either for sport, for meat, or in order to supply furs for sale to foreigners in Kabul (UNEP, 2003). Many of the larger mammals and bird species in Afghanistan are categorized by the World Conservation Union as globally threatened (IUCN, 2002). Among these, the Siberian crane is categorized by IUCN as Critically Endangered and is believed to face an extremely high risk of extinction in the wild in the immediate future. The country has only one endemic bird species, the snow finch (*Montifringila theresae*), which is suggested to be adopted as the national bird of Afghanistan.

As Afghanistan opens up to the world, we need to adopt policies to protect the intrinsic worth of diversified species of our biological heritage. It is suggested that adequate policies and implementation procedures to protect the threatened or endangered species have to be immediately put in place through a participatory mechanism and community efforts. Communal rights and innovations of our people and their traditional or indigenous technical knowledge (ITK) of their ecological wealth also merit protection. As articulated by Shiva (1997), the phenomenon of biopiracy that targets (ITK), inevitably leads to intellectual and cultural impoverishment, and denies creativity, collective well-being and informal ways of knowledge creation and dissemination, and results in making poor people poorer.

The loss of biodiversity thus has more than ecological consequences for Afghanistan. Loss of biodiversity translates into destroyed livelihoods and unfulfilled basic needs for the poorer population of the country, and could put a serious constraint to human development efforts.

3.5. Degradation of Water Resources, A Cause to Worry:

There would be an ensuing battle in coming years between increasing water demands and limited available water resources of the country as the process of reconstruction and economic development creates more demand for water. Surface as well as groundwater resources of Afghanistan have been severely affected by the continuous years of drought, as well as the uncontrolled and mismanaged extraction procedures. As dependence on groundwater resources increased, deep wells have been drilled without considering the long-term impacts on regional groundwater resources, including traditional *karez* systems. Many of the country's wetlands are completely dry and no longer support wildlife populations or provide agricultural inputs. For example, over 99 per cent of the Sistan wetland found to be completely dry in the winter of 2002 (UNEP, 2003). Furthermore, wind-blown sediments and silt are filling irrigation canals and reservoirs.

Groundwater levels over large parts of the country have fallen due to continuous years of shortfall in precipitations that resulted in over-extraction of water for irrigation and household supply. A local analysis reviewed by UNEP (2003) indicates that the groundwater level in Kabul, for example, has fallen by 1.7-4.6 m in the last three years. In Kandahar, the water table is dropping at an estimated 1-8 m per year and several shallow wells have dried out. This is while an enormous amount of water is also going to waste for poor water management technologies. Water-use efficiency is very low in all sectors, particularly in irrigation that causes losses through evaporation of over half of the precious water supply. There are also significant water losses due to outdated water supply infrastructure, lack of maintenance, and poor water supply management practices in urban areas.

Treatment and recycling of wastewater is almost non-existent. Wastewater collection barely exists in cities, often spewing into open gutters and canals, posing an extra risk to the poor children who gather in these places to play. Perhaps worst of all, urban drinking water supplies are being cross-contaminated with coliform bacteria (such as *Escherichia coli*, which infests the large intestine of both humans and animals) posing a considerable risk to public health. Water resources across the country are also threatened by contamination from waste dumps, chemicals and open sewers. As the UNEP report (2003) indicates, water samples taken in Kabul clearly indicate that the city's drinking water quality is cross-contaminated by sewage. The samples revealed high levels (18 to more than100 counts of bacteria in 100 ml of water) of contamination with coliform bacteria. According to this study, groundwater wells only 10–25 m deep throughout the city are at risk of contamination from surface sewers, damaged septic tanks and waste deposits.

Fecal bacteria infected 70 per cent of Kabul's shallow wells. In Mazar-e-Sharif, *E. coli* contamination was found in samples or urban water, which also contained nitrate levels at or above the WHO guideline of 50 mg/l. In Herat, tap water samples contained high levels of total coliform and nitrate levels, twice that of the WHO standard (UNEP, 2003). When the current drought ends, cases of cross-contamination will probably worsen, as rising groundwater levels wash out contaminants into the aquifers. As a result of water pollution, water-borne diseases are rife all over the country, particularly among the most vulnerable and poor population, i.e.,

Environment and Human Development in Afghanistan

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children and women. Water pollution as measured by organic pollutants and suspended solids is a very serious issue in today's Afghanistan, and requires immediate attention.

3.6. In HD Access to Clean Water Counts:

In Afghanistan, as reported by XGNS (2002), more than 170,000 children under one year of age die every year because of the shortage of potable water. The report estimates that only 23 percent of the Afghan people benefit form clean water, and almost 50 percent of the diseases that pose a threat to children's lives are caused by the lack of access to clean water.

Water pollution and water scarcity affect human health in three primary ways as argued by Agarwal, and Narain (1999):

- Access to a minimum per capita amount of water is necessary to ensure physical survival and promote hygiene.
- Contaminated water serves as a pathway for exposure to microbial and contagious diseases. Therefore, drinking or bathing in water contaminated by animal or human excreta facilitates transmission and proliferation of disease vectors.
- Surface and groundwater can act as sinks or transportation routes for chemicals, heavy metals, algal toxins, and organic substances that produce chronic systemic illnesses, malignancies, and birth defects, and impair immune system function as a result of direct or indirect exposure.

The health of Afghans depends, to a great extent, on the quantity and quality of its drinking water supply, the quality of which is largely determined by sources of incoming water, modes of water supply, and the level of water treatment. With the absence of a national standard for water quality, ground water wells are the most common source of urban drinking water, while rivers and canals are the major source for rural residents in many parts of the country.

Few Afghans in urban areas have access to tap water, while the largest portion of the urban as well as rural population still relies on hand or motor-pumped wells, or they fetch water directly from rivers, ponds, or wells, with little or no treatment at all. City water supplies have been overwhelmed by wastewater infiltration and are ridden with *E. coli* and coliforms. These conditions represent a severe threat to public health that is likely to worsen as demographic pressures on Afghanistan's cities increase in the years ahead.

Currently, Afghanistan's urban water supply networks are highly inefficient. As it was found that Kabul's supply was severely damaged during the many years of conflict and absence of regular maintenance. It loses as much as 60 per cent of its supply due to leaks and illegal use. It covers perhaps a quarter of the city's population and operates for only eight hours a day due to electricity shortages. Kandahar's water supply, which serves 30 per cent of the city, functions six hours a day, and loses an estimated 70 per cent of the water through leaks. Because the water service is not metered, there are no incentives for water conservation, causing water to be wasted when it is available. In Herat, drinking water is supplied by one public network, which loses 30 per cent of its supply to leaks in the system and only 10 per cent of its 150 public taps are functional. Mazar-

e-Sharif 's system is also in very bad shape: the main network serves less than half of the city's residents for only four hours a day. The rest of the population relies principally on shallow wells that tend to be heavily laden with biological and chemical contaminants. Each well serves an average of 120 families, and more than half the wells' hand pumps do not function reliably (UNEP, 2003).

A decent standard of living, which is a requirement of sustainable HD, necessitates an equal and adequate access to improved and clean water sources by all groups of Afghans, being rural or urban, men or women. HPI-1, which measures the deprivations for developing countries, covers the per cent of population not using improved water sources. Previous estimates concerning access to safe water range from 12 to 23 per cent of the urban population (UNEP, 2003). This reveals that currently about more than 80 per cent of the population in urban Afghanistan, and almost the entire population in rural Afghanistan, do not have access to clean water resources.

3.7. Air Quality Determines the Human Health:

Of all environmental challenges, the levels of air pollution are the most obvious in major urban centers of Afghanistan. However, due to the prevailing public ignorance, the average residents of these centers are so used to this ever-worsening situation that it does not bother them at all. Public media and state authorities are as ignorant of the situation as the ordinary citizens. Although no systematic study have been carried out to find the amount of suspended particulates, it is quite safe to assume that Afghanistan's urban dwellers are exposed to many of the worst toxic and carcinogenic air pollutants known. Smog is a common phenomenon in Kabul and other major cities of Afghanistan, while a combination of dust and smoke particulates are common air pollution in rural Afghanistan.

The principal source of air pollution in Afghanistan is fuel use: in small-scale industry, heating and cooking, road transport, increasing diesel-burning motor traffic, construction, and finally ecological degradation, with each having different causes, characteristics, and impacts. Dust and vehicle emissions in urban Afghanistan are the main factors negatively affecting air quality. Current assessments of vehicle density in the country amount to almost half a million cars, 30000 buses and 50000 trucks, figures that are growing rapidly (UNEP, 2003). Most of these vehicles run on low-grade diesel. During late autumn and winter, air quality is worsened by the increase of domestic emissions arising from inefficient residential heating technologies. Electricity shortages and a lack of access to fuelwood force the poor population to resort to burning packaging materials, including plastic that causes the emission of toxic fumes.

Western and north-western parts of Afghanistan also receive considerable amounts of toxic pollutants originating from the Aral sedimentary basin (Pearce,1994). Some industrial parks in Iran, Turkmenistan and Uzbekistan are located not far from the national boundaries of the country, causing trans-boundary air pollution. How much of the pesticides originating form these countries and world-wide end up on the Afghan land through air currents and rain, is not known.

Results of air sampling in major urban centers of Afghanistan by UNEP (2003) indicate high amounts of dust and concentrations of poly aromatic hydrocarbons (PAHs), most likely

originating from vehicle exhaust emissions. Benzo-a-pyrene is also one of the pollutants detected and is believed to increase risk of lung cancer. The highest concentrations were detected in Mazar-e-Sharif, where analyses show 13.6 Ng/m3. Concentrations for Kabul and Kandahar were at the range of WHO allowable values (1-10 Ng/m3), while those for Herat were below WHO values. The potential risks to human health from PAHs through inhalation are increased by the presence of dust in the air, for it binds hydrocarbon particles and prevents them from escaping into the upper atmosphere.

This is particularly of concern in the city of Kabul, where a combination of conditions, such as the topographical configuration of the landscape and cold climate makes the situation even worst. In Kabul, particularly during the cold seasons, the heating and energy needs for transportation are substantially increasing. Topography in Kabul is such that it leads to frequent thermal inversions, an atmospheric condition that can cover the city for days, resulting in air pollution to the extreme concentrations, which in some cases, brings the visibility to only a few meters.

The considerable increase in the number of diesel-fueled used vehicles in the past few years is of concern. Given the poor level of maintenance, with the exception of greenhouse gas emissions and the dissemination of huge amounts of extremely small particulates, the main pollutants emanating from the exhausts of these vehicles are nitrogen oxides (NOx), and a wide range of other toxic substances including lead, carbon monoxide, and hydrocarbons, with the ensuing photochemical production of smog and ground level ozone. It is well know and documented that air pollution from car exhaust emissions and the burning of fuels at home kills thousands of people mainly from respiratory damage, heart and lung diseases, as well as cancer.

Though, air pollution is seen as affecting only towns and cities, more than two-thirds of the mortalities emanating from air pollution are found to happen in rural areas (Fukuda-Parr and Shiva Kumar, 2003). In Afghanistan, the rural population and nomads are at the bottom of the energy ladder, and must burn dung, wood and crop residues for cooking and heating indoors or inside their tents *(ghidjdis)*. This results in filling their poorly ventilated houses and tents with smoke, exposing them to very high levels of dangerous toxic substances that cause severe health problems and even death. Both indoor air pollution and poor nutrition increase susceptibility to respiratory infections among these groups of people. Among them, the women and children, who spend most of their time indoors, are disproportionately affected.

As the demand for cooked bricks are rising in urban areas, township and village enterprises are responsible for a growing part of CO2 emissions by typically running exceedingly polluting brick cooking operations. Seasonally, burning of straw covers some countryside areas in thick smoke, a double loss, since this potentially substantial source of energy is transformed to smoke and dust for no purpose at all.

Air pollution is considered as one of the leading risk factors for respiratory diseases, such as chronic obstructive pulmonary disease (COPD), lung cancer, pulmonary heart disease and bronchitis (CHDR, 2003). The scale of health impacts on HD in Afghanistan from air pollution would be depending on such aspects as improved air quality and inspection regimes, better traffic

flow management, reduction of dependency on small motor vehicles, improvement of the efficiency in household energy use, and above all, an adequate policy for a sustainable urban development. A design and implementation of a national air quality standard and policy could be a prerequisite to the achievement of these goals.

3.8. The Same Old Problem of Solid Waste Management:

Despite low levels of consumption and production, solid waste management is already one of the country's major environmental problems. Poorly managed domestic solid waste seriously threatens the health of the people, so, the proper management of solid waste is clearly an urgent priority in urban Afghanistan.

In most areas of urban Afghanistan sanitation is lacking, resulting in waste heaps to become mixed with excreta, contributing to the spread of infectious diseases. For example, in the city of Kabul, the smelly dumps litter roadsides, back streets and empty lots, and the vicinity of public hospitals, restaurants, as well as local industry. In most of these cases, piles of industrial and hospital waste leach toxic substances into surface and ground waters. Again the poor suffer most. They live near waste disposal sites, and their children are the waste-pickers. In most of urban centres, the uncollected domestic waste is also the most common cause of blocked drainage channels, increasing the risk of flooding and water-borne diseases.

Toxic effluents from chemical and mechanical shops in urban centres of Afghanistan also play an increasing role in environmental pollution. The typical contaminants from these sources are mainly grease, used automotive oil, acids, heavy metals such as cadmium and lead, and to a lesser amount pesticides. Workers in facilities that handle toxic materials and people living close to waste disposal areas are the main victims of the effects of these contaminants. Dumping and improper disposal of such materials are common, allowing waste to leach into and contaminate the scarce underground water supplies. Again it is the poor who suffer the most acute effects from these toxins.

In rural Afghanistan, farmers, who apply pesticides or insecticides to their fields, neither have adequate training, nor protective clothing. With lack of functioning literacy in rural Afghanistan, peasantry are often unable to read even simple instructions, thus are exposed to serious health hazards from the unsafe use of these chemicals. Considering these circumstances, policy on pesticide/insecticide should be directed from the use of chemicals towards a more integrated pest management and biological control mechanism that have proved to be successful alternatives to the formers (Lean, 1992), especially if the methods of organic agriculture are adopted as a basic means for rural development in Afghanistan.

In Kabul, the waste generation is 900 tons/day, while the total collected waste is 210 tons/day, and there are only one available truck for 85000 people/day, with the number of collection workers one for each 3000 people (Turbot, 2003).This is while, there are no proper landfills in any of the towns and cities, and none of the dumpsites are taking measures to prevent groundwater contamination or toxic air pollution from burning wastes. In some cases, such as in Herat, dumpsites have been located in dry riverbeds upstream from the city, where first period of

sustained rainfall could wash the dump's contents back into the city. In places that collection facilities exist, they are not managed properly, i.e., hazardous, medical, industrial, household and inert wastes are mixed together without regard to safety considerations or collection efficiency.

Investigations of the groundwater system that feeds wells near Kabul's Kampani landfill revealed that this system is not protected from contamination due to toxic leachate, and the drinking water quality is compromised (UNEP, 2003). Similarly, the Kabul's now inactive landfill, Cham-Tala, contains over 30 hectares of waste piled 2-3 m high. Although the site is relatively stable during the current drought, there is no gas or leachate monitoring or management system in place, and future rainfall could quickly cause instability and pollution.

As the concern about dealing with domestic solid waste is increasing, innovative attempts have to be made to transfer waste into a useful commodity in the form of compost fertilizer. The major composition of waste in Afghanistan is still that of primary biodegradable organic materials. Though, the amount of plastic and other synthetic materials, which take much longer to decompose, is in the rise, particularly in affluent neighbourhoods of major cities. Still, composting method of solid waste disposal, which has been shown to be successful in similar circumstances, e.g., in the case of the city of Alexandria, the second largest city in Egypt (Seragledin, et al., 1995) is deemed to be a viable way to deal with the solid waste problem in urban Afghanistan.

To improve the health of the people and reduce stress on the environment, innovation in sanitation and water treatment that does not use chemicals is also required. Technical innovation could better enable human excreta to be recycled for both urban and rural agriculture. By linking urban biodegradable waste to agriculture and recycling its nutrients, food production can increase and degraded lands can be reclaimed (PEI, 1999). This requires that urban policy makers have better understanding of water and nutrient cycles as they pass through communities and households, and a good inventory of the current natural resource base of their provinces.

3.9. Poor Sanitation Threatens HD:

The current level of sanitation in urban Afghanistan is disturbingly poor. In 2000, it was estimated that only 8–12 per cent of the urban population had access to adequate sanitation (UNEP, 2003). With the return of refugees and the increase of settlements in urban centres, this problem seems to become more serious.

Wastewater treatment is almost nonexistent in Afghanistan. Only the city of Kabul collects wastewater from districts 9 and 16, which are home to approximately 100000 residents, and delivers it to a wastewater treatment plant. The treatment plant processes about 12000 m3 of wastewater daily, discharging its effluent into the Kabul River. Samples taken from the river revealed counts of over 100 of both *E. coli* and total coliform in 100ml of water. The rest of the city has to deal with environmental and health consequences of letting the wastewater onto open sewers or streets, posing major health hazards to the public.

In the past 50 years, the major objective of water and sanitation improvement efforts has been to provide people with an adequate supply of safe water and excreta-disposal facilities. It has been assumed that the provision of improved water and sanitation would keep people healthier, increase their productive capacity, reduce health care costs, and help lift people out of poverty. Sanitation was demonstrated to have larger health impacts than improved water supply. Lack of improved sanitation, and inappropriate sanitation technologies, such as untreated urban sewage, were found to be a primary source of water pollution (Esry and Andersson, 1999).

Sewage has become a major environmental problem in urban areas that particularly affects the poor. Centralized planning has had to contend with sludge removal, overflows of sewer systems, concentration of and exposure to pathogens, and toxic gas buildup. Perhaps this explains why 95 percent of sewage in developing countries is discharged without treatment into bodies of water. Use of fresh water to dispose of human excreta not only reduces an already finite supply of fresh water in arid countries such as Afghanistan, it also contaminates water bodies where it is discharged. Water and wastewater treatment is becoming increasingly expensive and pathogens, industrial toxins and agriculture wastes are proving increasingly difficult to remove (Satterthwaite, 1999.)

Sanitation in Afghanistan deserves more attention and innovation. Historically, water improvements have been considered without attention to sanitation, while modern sanitation technologies have been based on water. In Afghanistan particular circumstance, it is necessary to reverse this trend, to think of sanitation without water, and not to consider water improvements without sanitation. Pertaining to this problem, there are several policy principles that need to be promoted and fostered:

- Human excreta is a valuable resource, not a waste (Jenkins, 1999). It has valuable nutrients for biomass production, but when placed in water they become toxic to aquatic life forms and lead to human health problems.
- The starting point should not be how much pollution the environment can assimilate, but how much we can achieve zero-discharge, returning nutrients to land and recycling.
- We should try to find ways to protect water and treat it without using chemicals, which are now known to cause human health problems (PEI, 1999).

Ecological sanitation seems to be one of the good choices for Afghanistan to tackle the discussed problems of poor sanitation. This means that human excreta should be prohibited from being wasted or discharged into water, in rural as well as urban areas. This will require considerable technical innovation. The suggested ecological sanitation is a system that not only prevents disease and conserves and protects water sources, it also recovers and recycles nutrients in a non-polluting way.

The simplest way is to divert urine (which is largely sterile and contains most of the nutrients for plant growth) from feces. All organic waste, including human excreta, should be recycled and composted to return nutrients to land, from where they came. This would require technology development to capture resources from excreta and other organic matter, as well as a change in

regulations. Nearly 80 per cent of people in urban Afghanistan are also engaged in agriculture of one form or another, food or horticulture. Thus, nutrient recycling is not merely a matter of rural-urban connections, but of urban-urban connections as well. There is, therefore, an urgent need for Afghanistan to develop a set of comprehensive waste management policies to address the entire life cycle of waste, from consumer behavior to final disposal. However, to implement such policy, strong political will and commitments are the prerequisites.

3.10. The Energy Crisis in Afghanistan - a Constraint to HD:

There are multiple links between energy, poverty and the environment. The production and use of energy have environmental consequences to which the poor are especially vulnerable. People living in poverty are often disproportionately the victims of the environmental effects related to energy. This is because they use inefficient and relatively more polluting energy carriers and systems than those who are better off. While low energy consumption is not a cause of poverty, the lack of available energy services correlates closely with many poverty indicators. Addressing the problems of poverty requires addressing its many dimensions, e.g., inadequate or unavailable educational opportunities, health care, and accessible and functional sanitation facilities. Addressing these issues involves increasing the level of energy services (Morris and Sudhir, 1999), which is a prerequisite to a sustainable and adequate living condition.

At this time, Afghanistan is an energy-deprived country, and per capita energy use here is substantially low by international standards. Afghanistan has sufficient energy reserves, and has the potential of developing almost all major energy resources known to humanity on its own territory. Potential energy resources in Afghanistan include fossil fuels such as coal, oil and gas, and more importantly sufficient renewable sources such as hydropower, geothermal, wind, solar energy, and biomass such as fuelwood, straw and other agricultural by-products, which yet are not being exploited in a sustainable way. For example, the total hydroelectric potential of the entire Amu Darya River amounts to 306 billion kilowatt hours (Vinogradov, and Langford, 2001), while to date only 10 per cent of the hydroelectric potential of the Amu Darya in Afghanistan has been developed. Despite the current energy crisis that the country faces, only negligible amounts of available energy resources of the country are tapped in sustainable ways.

It is understandable that energy use is set to increase as the reconstruction efforts advances in the country. So the energy-related environmental stress could increase likewise. With sustainable economic development programs at the center of overall reconstruction efforts, environmental protection policies must be integrated with energy policies of the country. A key challenge is how to provide essential energy services without incurring unacceptable damage to human health and the environment. Government capacity to drive sustainable energy development is crucial given energy's central role in society and its need to be centrally coordinated. In the view of the author, the development and promotion of renewable energy will be crucial in shaping the energy policy in Afghanistan, particularly the hydropower sector, which should be given priority in sustainable development strategy of the country. Afghanistan has the most to gain from a "sustainable energy" policy, i.e., from developing those energy resources that support sustainable human development.

IV. The Ongoing Response

4.1. Consequences of Damaged Ecosystems:

Recent as well as long-term changes in different ecological settings of the country reflect how loss of biodiversity reduces the ability of ecosystems to support human society. The flooding that hit large parts of northern and northwestern Afghanistan in recent years, or the flooding of the past two years in southeastern Afghanistan could partly be explained by the loss of ecological services of forest biotopes that could have moderated the impact of heavy rainfalls. Silting up of reservoirs, especially along the Kabul River, carrying enormous costs in terms of lost capacity and reconstruction. This is a direct result of successive destruction of a naturally diverse vegetative cover upstream that was to protect soils from eroding.

Local environmental concerns such as water pollution and contamination, air pollution, waste disposal have immediate and directly attributable effects on people. Dirty water causes disease; air pollution and inadequate waste disposal make people sick. Widespread illnesses from contamination by sewage in urban centres not only affect the human health, but people's livelihoods and survival. Thus, the quality of environment has a direct impact on a society's health and well-being.

The policy makers in Afghanistan have an opportunity to reverse the trend of environmental degradation in the country through formulation and implementation of environmental policies. As we have discussed in previous sections, some of the largest sources of pollution in the country comes from domestic and commercial waste, fuelwood and diesel burning for residential heating, uncontrolled building, uncontrolled solid-waste dumping, discharge of raw sewage into rivers and streets, emissions from diesel-fuelled old vehicles, chemical and car-repair industry, and use of pesticides and run-off from agricultural activities. These are the concerns that should be given priority.

4.2. Our Current Stance:

While environmental concern and sustainable development is the agenda of international community, including many developing countries, Afghanistan is facing a devastating environmental crisis unprecedented in its history, which in turn contributed to the immense environmental scarcity (Homer-Dixon, 1999) that affects the livelihoods of millions of people and endanger the continuity of a very ancient civilisation in this part of the earth.

Luckily, it seems that environment is gradually getting an increase priority since in the context of the National Development Framework for Afghanistan (NDF, 2002), sustainable development was identified as the path of development and reconstruction. Based on this, a program for the management of natural resources has been established, resulted in the creation of an environmental directorate in the Ministry of Irrigation, Water Resources, and Environment (MIWRE).

Although not quite at the same level as economic growth or poverty alleviation, now, environment is deemed to be firmly a national priority. With this framework in place, it is

suggested that national goals have to be established in par with the MDGs, to include environmental policy objectives, technical targets, and implementation measures, without further delay. Institutional framework for environmental management capacity has to be strengthened and revised to satisfy these goals. It is suggested that too much reliance on the state to address problems, as is the case of today's Afghanistan, is a problem in itself, and encourages the state to response in more reactive manners, with a focus on costly cleanups rather than effective preventions. While such a strategy is good for our short-term goals, but the long-term environmental policy must engage the community and adopt participatory strategies in an effort to tackle the underlying environmental drivers, rather than being only concerned for environmental impacts remediation.

4.3. Environmental Protection and Management:

Sound environmental management has been shown to impact the quality of human's life in terms of enhancing livelihoods, improving health and reducing vulnerabilities. Historically, almost 7000 years ago, the forerunners of the modern Afghanistan were the first to introduce and establish a sound agricultural civilization using technologies that are still in use and valid (Denniston, 1995). Moderate ways of exploiting natural resources and protecting their habitat was the key to their success in cultural sustainability. However, due to cultural erosion, today the table is turned towards the elimination of environmental measures that were imbedded in their traditional knowledge, and hence, the demise of the historical culture and traditional environmental management of this land is eminent.

Modern environmental measures have to be developed to protect the fragile natural ecosystems of Afghanistan. Protecting the natural resource base will contribute to economic growth, social stability, and sustainable human development. However, the global environmental enlightenment of the past few decades that could have initiated such a process, did not seem to have any impact on the way the governments of Afghanistan and even the people of the country looked upon their natural heritage then, and consequently almost nothing have been done to improve environment and take measures in environmental protection and awareness.

Today, this situation is changing, and environmental protection is a concern for many citizens of Afghanistan. Developing sustainable environmental programs to achieve this goal requires greater involvement and participation of communities all over the country. In this framework, developing a system of well-designed nature reserves and national parks could be considered as an effective tool to reduce levels of ethnic-based tensions and conflicts, improve security to allow greater freedom of movement, and promote a new culture of trust among Afghans.

In the short-term, it is obvious that economical growth development in Afghanistan will be largely dependent on technical assistance of the international community. Environmental impact assessment (EIA) of all reconstruction and new projects in Afghanistan is a prerequisite to sustainable development in a healthy environment. To address this important issue, a responsive and sound policy to fit the needs and circumstances of Afghanistan has to be adopted and implemented quickly.

Given the weight of energy requirements of development and reconstruction projects in Afghanistan, immediate undertaking of power generation projects and expansion of this sector is needed. Although, more attention needs to be given to other renewable sources of energy, such as geothermal, solar, and wind, but the development and expansion of environmentally-sound hydroelectric infrastructure projects for power generation, as well as reservoir capacity increase is still considered as a priority for Afghanistan.

A national policy is needed for environmental protection, aimed at the preservation and protection of our natural heritage sites, such as valuable wetlands, forests, and savannahs of the country, at reforestation, at the maintenance of river basins and watersheds, and at the preservation of the country's scarce soil resources. Such a policy would combat soil erosion and desertification, pollution by waste materials and poisoning by the dumping of dangerous substances. Development of a sustainable, clean and toxin free environment requires the formulation and implementation of environmental policies to address such issues as EIA, degradation of water resources, land use, energy, agriculture, forests, and trade. Our international trade and investment policy should not merely aim at attracting investment and promotion of growth, but must also meet fair and acceptable international environmental criteria and standards.

4.4. Afghanistan's National Capacity in Environmental Protection:

For the first time in the history of Afghanistan, an authority (MIWRE) for environmental management was mandated in the new governmental structure. A Department of Environment has been created in this ministry, but presently it does not have adequate expertise to work specifically on environmental management issues.

Traditionally, governance in the country has been largely based on the provincial, municipal and local levels, rather than centrally led from Kabul. Strengthening of local capacity in environmental management must be the focus of national policy in environmental capacity development.

The new constitution of Afghanistan is the main legal framework for environmental protection in the country. Based on this legal framework, the following laws contain important and valid environmental provisions, though, none accurately reflects the new institutional arrangements, or contain modern provisions for environmental management and protection:

- Water Law, 1981
- The Forest Law of Islamic Emirate of Afghanistan, 2000
- The Islamic Emirate of Afghanistan Law for Land Ownership, 2000
- Nature Protection Law 1989/2000
- Agricultural Quarantine Services Law, 2000
- Veterinary Services Law, 2000
- Hunting and Wildlife Protection Law, 2000
- Range Management Law, 1970/2000
- Agriculture Cooperative Development Law, 2000

"The obvious is often the most difficult to see."
Mahbub Ul Haq

Environment and Human Development in Afghanistan

Introduction:
From the human development (HD) perspective, in this paper, it is attempted to find out and discuss critical environmental problems of Afghanistan, and provide a snapshot of the status of environment by illustrating how the activities of people have affected the environment and how environmental decline is affecting people and the economy.

In this framework, standing environmental policies and strategies are debated to assist the decision-makers of Afghanistan in charting meaningful environmental strategy and priority programs based on the HD philosophy and methodology. This paper is outlined in five interconnected sections in an attempt to picture the state of the environment in present Afghanistan by describing the most important physical and geographical constraints that this land provides in its ecological inventory for its inhabitants. This work is not a state of the environment report, but a critical assessment of challenges and choices that are to be met. All the ensuing discussions in this paper are aimed at stimulating a healthy debate on identifying suitable solutions and policies for the current as well as the future environmental problems that may lie in the road ahead.

In section one, the issue of environment and HD, environment in the context of Human Development Index (HDI), the concept of sustainability in the framework of HD, the nexus of environment and poverty, environment and gender, and the role of environmental awareness in human development are discussed.

In section two, a general definition and description of environmental components of Afghanistan is provided, including a historical perspective of the land diversity, mountains and deserts, farmlands and pastures, and water resources.

Looking at how the natural environment is affected by and is affecting various human processes, including the human health, in section three, an outline of the current state of environment in Afghanistan is provided. A general account of environmental conditions in Afghanistan, and a broad description of the current status in terms of issues, such as degradation of land resources, land degradation and human security, deforestation, loss of biodiversity, degradation of water resources, access to clean water, air quality, solid waste management, energy crisis, and the impact of these on human health and welfare are discussed. These are considered to be the central elements in determining the limits of HD in Afghanistan.

Section four is dedicated to the current response of the Afghans. Issues such as the current stance of the policy makers in regards to environment, environmental protection and management,

- Charter for Department of Fertilizer and Agro-Chemical, 2000
- Seed Improvement Department Charter, 2000

With new environmental policies yet to be defined, no new environmental legislation has been developed. Due to the lack of human resources, equipment, funding and capacity, there is little or no active monitoring or enforcement of existing laws or new decrees. A process for conducting EIA of all humanitarian and reconstruction projects is absent from Afghanistan's legal framework. As a result many projects, such as deep-well drilling or large-scale irrigation schemes, are being conducted without considering regional or long-term impacts and environmental costs. There is also no consistent application of EIA guidelines used by donors and international organizations (UNEP, 2003).

The process of ratifying and implementing global conventions has been influential in placing environment issues high on the national political and development agenda. Afghanistan has ratified and is currently a party to the following five international environmental agreements:

1. Convention Concerning the Protection of World Cultural and Natural Heritage, which was ratified in 1979.
2. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), to which in 1985 Afghanistan became a party.
3. The Convention to Combat Desertification (CCD), which was ratified in 1995.
4. The Convention on Biological Diversity (CBD), which was signed by Afghanistan in 1992, and has been ratified in September 2002 by the Transitional Authority.
5. The United Nations Framework Convention on Climate Change (UNFCCC), which was ratified in September 2002 by the Transitional Authority.

In 1989, the government of Afghanistan has signed the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (The Basel Convention), but yet to ratify it. Among the above, the 1992 Biodiversity and Climate Change Conventions, together with Agenda 21, created a new international environmental framework. The framework includes new legal principles and concepts that require from nations a different approach to the regulation of the protection of the environment to achieve their sustainable development goals (Ayesha Dias, 2000). Afghanistan's new national regulatory systems should incorporate the precautionary principles as well as new tools and concepts advised in these frameworks to promote the protection of the environment in the country.

4.5. Some Policy Options:

Afghanistan is at a juncture of increased environmental scarcity with declining environmental quality and intensified societal pressures on ecosystems. Ecological damage, water and air pollution, solid waste, deforestation, desertification, and losses of biodiversity in Afghanistan affected, above all, the life options for the poorest, among them specifically the women, who have to bear the consequences the most. Although some of the ecosystem and biodiversity losses from the previous decades are irreversible, development and implementation of integrated economic and environmental policies may be helpful in reducing the human impacts on the environment,

and vice versa.

Good governance is an essential tool to achieve these goals and steer back towards environmental sustainability. Reversing and minimizing the impact of environmental degradation on human development, particularly its unequal impacts on the poor and women, and ensuring environmental sustainability raise a number of important policy questions. These cover efficiency in the use and management of environmental resources, clean and green production technologies, and appropriate waste management.

Equal and efficient access to natural resources, and the rights and entitlements of citizens to communal property are other issues that merit to be raised. Among these, environmental management is the very important one. Strengthening it requires the provision of a strong role for communities in implementation of the policy, and a leadership role for the state in designing and promoting the policy. A stronger alliance between local communities, institutions of civil society and government will facilitate such roles.

Responsibility for environmental protection is currently perceived to lie in the hands of the government. Only the increase of environmental awareness among the general public could change this view. This requires appropriate policy and continuous awareness campaigns through public media, so the personal responsibility for the environment becomes pervasive among the people. The concept of environmental governance has to become part of national discourse to encourage information disclosure and public participation.

It is true that the rapid deterioration of water and air quality, as well as the solid waste crisis in urban Afghanistan cry out for action without delay, but soil erosion, land degradation, and deforestation are problems that have to be tackled now to prevent further disasters. Rapidly expanding regional and global economy challenges the people of Afghanistan to adopt a strategy in an attempt to keep the balance between natural resources, environment, population and economic development in the face of dramatic increase in demand on these natural resources. How to achieve and maintain a sustainable environment is an extremely important issue for human development and sustainable economic development of a country that has to develop all its resources from the scratch. This means a big change from the notion of business as usual.

V. Conclusion

5.1. Our Choices

The stage for successful reconstruction of Afghanistan, based on a sustainable development agenda is ready. It is now a matter of making the right choices to help make this happen. In this framework, the environmental situation is already a major concern. Air quality in cities, rural areas, is often appalling, leading to health problems and substantial economic losses. Water quality is equally poor. Many rivers have gone dry, as groundwater stocks sink to new depths each year. Likewise, natural capital in the form of land, forest and biodiversity is under a long-term decline. These factors combine synergistically to negatively affect human health and welfare. They increasingly constrain economic prospects and growth, and so pose a serious threat to Afghanistan's mid and long-term stability, and sustainable human development. Yet, there are

alternatives. Air and water resources can slowly be restored, forest and land degradation can be interrupted and even reversed, and biodiversity losses can be halted.

To achieve these goals, the establishment of frameworks only is insufficient. Action is needed, and this requires a major effort and commitment by many actors. In recent years, the scale of action in environmental arena has been almost negligible, both on the part of the Afghanistan central and provincial governments, the international agencies, and NGO community.

Concerns over environmental crisis in Afghanistan are real. The facts of environmental degradation are far more than exaggerations. Shockingly, they speak for themselves:

- With poor sanitation and lack of solid waste management, most of the 16000 streets of Kabul stink. Hundreds of tons of garbage mixed with human excreta are littered all over the city to turn it into the dirtiest places on earth.
- On average, almost 85% of people do not have access to safe drinking water; and the groundwater levels are sinking deeper and deeper by the passage of each day;
- Air quality in major cities, particularly in Kabul, becoming intolerable;
- The poorest Afghans live in the most ecologically vulnerable areas, such as the provinces of Badghis, Ghor, Bamyan, Farah, and Uruzgan;
- Persistence of drought in the past years forced hundreds of thousands of people to abandon their self-sustaining life styles and become environmental refugees;
- Only in 2002-2003, the dust storms destroyed the livelihoods of tens of thousand of people, and buried more than 100 villages in the provinces of Farah and Neemruz;
- Wetlands of southwest Afghanistan have dried up and turned into desert;
- The fragile mountain forests are disappearing at a phenomenal pace;

Our environmental priorities are peculiar to us. At this point, we are concerned with much more basic elements of human survival, i.e., safe water and healthy land resources. Polluted water is a threat to life. Each year thousands of our children suffer from acute diarrhoeal diseases, malaria, tuberculosis, and trachoma. Just the provision of safe drinking water and sanitation and some education in hygiene can alleviate these environmental problems and relieve much human suffering. Eroded land is a treat to the livelihoods of 80 per cent of our country's population. Poverty is one of the greatest threats to our environment. If development policies are not adopted to overcome this, the poor will continue to overuse their natural habitat merely to survive. The consequent environmental depletion will affect generations to come. Thus, in the short-term, our efforts in environmental remedy should be focused on more localized phenomenon, such as air pollution, water pollution, soil degradation, and deforestation. Our national priorities for spending should be immediately redirected to the most basic needs and capabilities of the citizens.

It is obvious from the above discussions that the issue of environmental security merits being one of the main concerns in the overall national strategy for sustainable development in Afghanistan. It is required that the policy makers of Afghanistan develop a vision based on the long-term needs and aspirations of their people, whom should be placed at the centre of their policies. A model of

sustainable development must incorporate environmentally safe technologies into all investment planning and seek ways to reflect the scarcity value of environmental resources in decision-making to ensure sustainability of development (Johnson, et al., 1997). The success of such a model is dependent on its participatory and community-based nature. So, it must ensure control by local communities over their natural resources and draw on local wisdom, experience and traditions for the sustainable management of their natural resources such as water, land, soils, forests, rangelands, pasturelands, fisheries, and wildlife.

As the reconstruction is shifting gear, challenges become more complex. In such a circumstance, long-term thinking and planning can help integrate environment into development plans, policies and programs, and into all legislation, achieving prevention at a far lower cost than future clean-ups. Radical reform in the capacity of environmental management would be considered as the first step in the right direction. Reform and strong efforts are necessary elements, but even more efficient strategy and effectiveness is needed to safeguard Afghanistan's degrading environment.

To conclude, the following proposals and relevant policy issues are suggested:

- The right to a clean and sustainable environment should be guaranteed by the state.
- Establishment of a national environmental protection, management and information agency to design and implement environmental policy and develop capabilities for efficient environmental management.
- Implementation of public information campaigns on issues of environmental protection.
- Adoption of clean and green technology policy in all reconstruction and modernization projects.
- Adequate management of groundwater resources, watersheds, agricultural lands, and pasturelands through empowering self-regulated community associations.
- Development of environmental friendly energy resources such as hydroelectric, geothermal, solar, wind and biomass.
- Adoption and enforcement of strict standards to protect the environment against industrial, urban and agricultural pollution.
- Adoption of appropriate recycling and waste treatment methods and technologies.
- Effective participation in regional environmental protection programs.
- Ratification and implementation of international treaties concerning the environment.

The possible result of all this discussion: if the current trend of environmental degradation in Afghanistan is not reversed, the people of this country will be pushed further into the abyss of human insecurity, poverty, social conflict and misery.

5.2. The Last Message:

This paper proceeds from a concern that present-day levels and practices of environmental degradation must stop, if our environment is to retain its capacity to sustain human life as an integral element of its ecological systems. There is a real opportunity at hand to adopt a policy to translate into progressive social evolution, human development, solidarity and the art of

sustainable quality living. At the time that coincides with the beginning of our march to development, it is up to the leaders, policy makers and interested stakeholders in Afghanistan to show the courage in making critical decisions in pursuit of a sustainable development path to enable us build a green and prosperous Afghanistan.

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Methodology:
In studying the current environmental developments in Afghanistan, one has to rely on both the available data, and also on "common sense", based on reasoning supported by anecdotal evidence, media reports, monitoring campaigns, and professional discretion.

References:
1. Afghan Government Statistics, (1994): Quoted in: Dr. M. H Sharq; Zhanda Pooshan-e Berahna Pa – Memoirs of the Former Prime Minister of Afghanistan (in Dari Persian), Peshawar, Pakistan, pp.94.
2. Agarwal, A., and Narain, S., (1999): Community and Household Water Management: The Key to Environmental Regeneration and Poverty Alleviation. Paper presented at the UNDP-EC Expert Workshop on Poverty and the Environment, Brussels, Belgium, 20-21 January 1999.
3. Anderson, N., Cesar Palha da Sousa, and Sergio Paredes, (1995). Social Cost of Land Mines in Four Countries: Afghanistan, Bosnia, Combodia and Mozambique; British Medical Journal, 311:718-721.
4. CHDR, (2002): China Human Development Report: Making Green Development A Choice, Oxford Univ. Press, UNDP, New York.
5. Cohn, M.R., (2001). The Face of a New Famine: Isolated Afghanistan nears 'edge of an abyss,' U.N. warns, The Toronto Star, March 25, 2001, Toronto.
6. Denniston, Derek, (1995). High Priorities: Conserving, Mountain Ecosystems and Cultures, (World Watch Institute), pp.80.
7. Department of State Dispatch, (1994), 6/6/94, vol.5, Issue 23, pp.372.
8. Dias, Ayesha, (2000): Human Rights, Environment And Development: With Special Emphasis On Corporate Accountability. Human Development Report 2000, Background Paper.
9. Dobbie, Philip, (2002): Environment in NHDRs. Presentation at the Second Global HD Course, Oxford University, Sept., 2002.
10. DPA, (2003): Deutsche Presse Agentur, as quoting from Afghanistan Bakhter News Agency, 7 July 2003.
11. Esrey, S. A., Andersson, I., (1999): Poverty-Environment Interactions in Water and Sanitation: Key Issues and Policies. UNDP. Unpublished paper.
12. FAO, (1981): National Parks and Wildlife Management, Afghanistan. A contribution to a conservation strategy. Based on the work of J.A. Sayer and A.P.M. van der Zon. Vol. 1, text. Food and Agricultural Organization.FO:DP/AFG/78/007. Rome.

13. FAO, (1993): Land Cover Map of the Islamic State of Afghanistan. 1:250,000 scale. Food and Agricultural Organization, Rome.
14. FAO, (1997): Food and Agricultural Organization AQUASTAT, Afghanistan Country Profile. Rome. Quoted in: Afghanistan: Post-Conflict Environmental Assessment, UNEP, Geneva, 2003.
15. FAOSTAT, (2000). Statistical Database 1990-1999 of the Food and Agriculture Organisation of the United Nations, Geneva.
16. FHCRAA, (2002): Future Harvest Consortium to Rebuild Agriculture in Afghanistan: Needs assessment on feeds, livestock and rangelands in Afghanistan. Coordinated by the International Centre for Agricultural Research in the Dry Areas (ICARDA). Cornwall.
17. Fu, Haishan, (2002). Calculating the Human Development Indices. Lecture given at the Second Global HD Course, Oxford Univ., Sept. 2002.
18. Fukuda-Parr, Sakiko, and Shiva Kumar, A.K., (2003): Unequal Human Impacts Of Environmental Damage. In: Readings in Human Development, Sakiko Fukuda-Parr & A.K. Shiva Kumar (eds.). Oxford University Press, New Delhi, pp.308-335.
19. Hasanyar, Amir Shah, (2000). The Effects of 1999 Drought on the Food Production in Hazarajat (in Dari Persian), Zarnegar, No. 73, Toronto, March, pp.41-42.
20. Holling, C.S., (1986). The Resilience of Terrestrial Ecosystem: Local Surprise and Global Change, in: Clark, W.C. and Munn, R. E.(eds.); Sustainable development of the biosphere, Cambridge, U.K., pp.292-317.
21. IRIN, (2003): The Iranian International News Agency quoting the UN Office for the Coordination of Humanitarian Affairs, 24 Jul 2003.
22. IUCN, (2002): IUCN Red List of Threatened Species. World Conservation Union (IUCN). Species Survival Commission. Gland. Quoted in: Afghanistan: Post-Conflict Environmental Assessment, UNEP, Geneva, 2003.
23. Jang, (1997). The News, Jang Daily Newspaper, Pakistan. July 13, 1997.
24. Jang, (2003): The News, Jang Daily Newspaper, Pakistan, July 10, 2003.
25. Jenkins, J. C., (1999): The Humanure Handbook, A Guide to Composting Human Manure, 2nd Edition, PA, USA, 302pp.
26. Johnson, et al., (1997): World Bank. as quoted in: China Human Development Report 2002, UNDP, Oxford University Press. New York.
27. Johnston, T., (1997). Reuter News Report, May 14, 1997.
28. Kapos, V., Rhind, J., Edwards, M., Price, M.F., and Ravilious, C., (2000): Developing a map of the world's mountain forests. In: M.F. Price and N. Butt (eds.) Forests in sustainable mountain development: A state-of-knowledge report for 2000. CAB International, Wallingford.
29. Lean, Geoffrey; (1992): WWF Atlas of the Environment, Oxford, Helican. As quoted in: Readings in Human Development, Sakiko Fukuda-Parr & A.K. Shiva Kumar (eds.). Oxford University Press, New Delhi, 2003.
30. Morris, Ellen, and Sudhir Chella Rajan, (1999): Energy as it Relates to Poverty Alleviation and Environmental Protection. Paper prepared for the UNDP-EC Poverty and the Environment Initiative, September 1999.
31. NDF, (2002): The Draft of the National Development Framework (NDF), April, 2002, Kabul, Afghanistan.

32. Pakistan NHDR, (2003): Pakistan National Human Development Report: Poverty, Growth and Governance. Oxford Univ. Press, UNDP, New York.
33. Partow, H., (2003): Sistan Oasis Parched by Drought. In Atlas of Global Change. United Nations Environment Programme. Oxford University Press, Oxford.
34. Pearce, F., (1994). Siberia at the Crossroads, Popular Science, vol.245, 2, pp.36.
35. PEI, (1999): The UNDP-EC Poverty and Environmental Initiative; Attacking Poverty While Improving the Environment: Towards Win-Win Policy Options, UNDP, New York, pp.78.
36. Ponting, C.; (1990): Historical Perspective on Sustainable Development. Environment, vol.32, No.9, pp.4-9.
37. Saba, S. Daud, (2001): Afghanistan: Environmental Degradation in a Fragile Ecological Setting. International Journal of Sustainable Development and World Ecology. Volume 8, pp.279-289.
38. Satterthwaite, David, (1999): The links between poverty and the environment in urban areas of Africa, Asia and Latin America. Paper presented at the UNDP-EC Expert Workshop on Poverty and the Environment, Brussels, Belgium, 20-21 January 1999.
39. Sen, Amartya, (1989): Development as Capability Expansion. In: Readings in Human Development, Sakiko Fukuda-Parr & A.K. Shiva Kumar (eds.). Oxford University Press, New Delhi, 2003.
40. Seragledin, Ismail; Michael A. Cohen; and K. C. Sivaramakrishnan; (1995): The Human Face of the Urban Environment. Environmentally Sustainable Development Proceedings. Washington, D.C., World Bank.
41. Shareq, A., Chmerioc, V.M., and Dronov, V. I., (1980). Geology and Mineral Resources of Afghanistan, (Nedra, Moscow), Vol. 1, Geology, pp.211.
42. Scherr, Sara J., (1999): Poverty-Environment Interactions in Agriculture: Key Factors and Policy Implications. Paper presented at the UNDP-EC Expert Workshop on Poverty and the Environment, Brussels, Belgium, 20-21 January 1999.
43. Selim Jahan, (1998): Unequal Human Impacts of Environmental Damage; Human Development Report 1998, Chapter 4, UNDP, New York, Oxford University Press, pp.66-85.
44. Shiva, Vandana; (1997): Biopiracy – The Plunder of Nature and Knowledge. Boston, Mass., South End Press.
45. Tapponnier, P., Mattuauer, M., Proust, F. and Cassaigneau, C., (1981). Mesozoic ophiolites, structure and large-scale tectonic movements in Afghanistan, Earth and Planetary Science Letters, 52, pp.355-371.
46. The Swedish Committee for Afghanistan; (1993). The Agricultural Survey of Afghanistan differed for United Nations. See Repatriation and Rehabilitation of Afghan Refugees: National Summary, Sixteenth Report, 1993, part 4, p.v.
47. Thomas F. Homer-Dixon, (1999). Environment, Scarcity, and Violence, Princeton University Press, pp.253.
48. Turbot, S., Masood, M., and Hamid, H., (2003): Kabul Waste, Crosslines Afghanistan Monitor, Issue 5, October, pp.10-13.
49. UNEP, (2003): Afghanistan: Post-Conflict Environmental Assessment, UNEP, Geneva, 175pp.
50. UNICEF, (2002): Nutrition and Health Survey in Badghis Province of Afghanistan, February-March 2002, UNICEF Afghanistan.

51. U.S. Bureau of the Census, (1988): Afghanistan- A Demographic Profile, January 1988.
52. York, Geoffery, (2001): Globe & Mails, Toronto, May 5, 2001.
53. Ul Haq, Mahbub; (1995): A Framework for Sustainable Development; in: Reflections on Human Development, Oxford University Press, pp.76-92.
54. Vinogradov, S., and Langford, V.P.E., (2001). Managing transboundary water resources in the Aral Sea Basin: in search of a solution. International Journal of Global Environmental Issues, Vol. 1, Nos. 3/4, 2001.
55. World Bank, (1999): Role and Size of Livestock Sector in Afghanistan. Washington. . Quoted in: Afghanistan: Post-Conflict Environmental Assessment, UNEP, Geneva, 2003.
56. WRI, (1996): World Resources 1996-97. World Resources Institute, Oxford University Press, New York.
57. XGNS, (2002): Water Shortage Causes Child Deaths in Afghanistan. Report by Xinhua General News Service, Islamabad, Thursday, March 2, 2000.

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national capacity for environmental protection, and some policy options and strategies have been discussed.

The fifth section concludes the debate by looking at the choices of the Afghans in environmental policies and programs that they may pursue. Some recommendations and a last message end up the paper.

I. Environment and Human Development

1.1. People Thrive in a Healthy Environment:

From the viewpoint of (HD), the true wealth of a country is its people, thus the basic purpose of development could be that of the enlargement of people's choices to lead lives that they value. There is no dispute that HD is related to people's physical well being, so human development could not be conceived as mere investments in human capital, but also embraces environmental sustainability as one of its essential components. So, it is explicitly expressed that HD is the process of expanding people's choices, i.e., "functioning and capabilities to function" (Sen, 1989).

The capability to lead a long and healthy life is one of the essential choices, and this is very much dependent on environmental factors, without which, the longevity or life expectancy dramatically decreases. In this context, the freedom of living in a healthy and sustainable environment is a must, and could be considered as a positive freedom, as defined by Sen (1989); similar to having the food you need for nourishment.

It is very important to understand that environmental damage not only threatens the earths' carrying capacity, but also the people's coping capacity. A balanced and healthy environment provokes civil participation, and is a means to achieve sustainable economic growth, equity of choices, and eradication of human poverty. Studies on quantitative impact of environmental degradation on GDP growth indicate the substantial adverse consequences of air and water pollution on public health and the adverse impact of deforestation and soil degradation on productivity in the agriculture sector (Pakistan NHDR, 2003).

In the context of HD, a healthy environment is a universal capability that is and valued by people across the world as a very important factor for a decent standard of living. Without a healthy environment, other capabilities are either not possible, or very limited. Thus, a healthy environment is almost a basic capability, which provides one of the basic requirements of leading a long and healthy life.

1.2. Environment in the Context of HDI:

It is known that the human development index (HDI) does not include environmental dimensions. In order to provide a more complete and holistic picture of the underlying factors that impede the process of HD in a particular country, it necessitates the HDI to include the dimension of environment into its computable components. However, considering the complexities of computability and interpretation in the case of adding more variables to this composite index

(Haishan Fu, 2002), it has been considered more viable to develop separate environmental indicators to function as complementary components in the context of HDI (Philip Dobbie, 2002).

Following the Rio Conference on Environment and Development, there has been a move to develop environmental indicators to measure the sustainability of development. A number of Environmental Indicators (EI) have been developed to try and assess the state of environmental damage in countries and allow for country comparisons. It is generally agreed that there is a serious need for a consensus on the variables used in formulating indices such that cross-country comparisons can be made possible (Aisha Talib, HDR 2002). A "Working List of Indicators of Sustainable Development", embracing the dimension of environment in HD, has been developed under the auspices of the UN Commission on Sustainable Development, few of which fall into the following category:

- Environmental, e.g.: freshwater resources, land use and management, desertification and drought, deforestation, biological diversity, biotechnology, agriculture, solid wastes, toxic chemicals and hazardous and radioactive wastes,

The above indicators are being currently tested and refined. They seek to gain insight regarding the progress made in achieving sustainable development (Dias, 2000). However, in the case of Afghanistan, the lack of data limits the use of many of these indicators. At this stage, it could be suggested that the preparation of environmentally adjusted national income accounts, by taking the depreciation of natural capital into account, as explained by Ul Haq (1995), could be a useful reminder of what we are doing to nature and what it is costing us in turn.

Another option could be the development of a national environmental index peculiar to Afghanistan to reflect particular circumstances of the state of environment and the data available on the pertaining issues in this country. This notion is considered to be compatible with the HD's methodology that requires peoples from different countries to come up with their own strategies and programs in handling their peculiar circumstances of the resources and constraints of their land.

1.3. The Issue of Sustainability:

Sustainability is a matter of distributional equality, of sharing the capacity for well-being between present and future generations, i.e., how to make sure that the "choices" of future generations will not be unfairly reduced by the current generation. Hence, HD conceives sustainability as a general problem of inter-generational equity. From this perspective, it is the duty of the State to watch over the unborn by implementing policies to ensure sustainability. Sustainability is a means to HD. It is to guarantee that our children will have a range of options at least as wide as the range we inherited. Thus, it demands a balance between the compulsions of today and the needs of tomorrow (Ul Haq, 1995).

If we Afghans are to adopt the basic concept of sustainable human development, then we must find a way to meet our needs without incurring debts that we cannot repay. That means avoiding the accumulation of environmental debts by polluting or exhausting our scarce natural resources. Our policy for growth must be more respectful of the physical environment that we live in, and it

must translate into the quality of human lives. However, it would be immoral to sustain the present level of poverty and misery in our country. Thus, keeping the former principles in mind, we should also understand that our current development agenda should focus attention on the present generation, which have a poor and miserable standard of living, than to solely engage itself with the future.

Today's Afghanistan does not have the capacity to formulate, plan, implement and manage environmental policy, and to incorporate these programs into its overall efforts in human development. It is required that the national capacity of the country to implement sustainable development must be strengthened. The first step in this direction has been taken by adopting the basic principles of sustainable development in the first draft of the National Development Framework (NDF) for Afghanistan (NDF, 2002). However, the mere adoption of strategies and programs are not sufficient by themselves. We have to make efforts to learn how to undertake the implementation of these policies. This means training people and setting up appropriate institutions based on the active participation of communities and project beneficiaries in the process of design and implementation of these strategies and programs.

In the framework of sustainable human development, environmental policies must help in bringing equity into the community, i.e., distributive justice for choices and opportunities among the participants of environmental projects, i.e., environmental policies should consider the right of groups of citizens, present as well as coming generations to a healthy and beautiful environment. That is sustainability in the context of human development. A sustainable environment in turn increases the possibilities of choosing, i.e., the freedom of participation.

1.4. Environment and Poverty:

Much of the interface between poverty and environment revolves around the effects of the environment on the poor. These occur in both the form of environmental hazards, i.e., biological pathogens and chemical pollutants in the air, water, soil or food, and physical hazards and environmental degradation, i.e., inadequate use or waste of renewable and non-renewable resources, high levels of generation for biodegradable and non-biodegradable wastes, etc. (Satterthwaite, 1999)

Environmental degradation hits those living in poverty the hardest. The majority of those who suffer from air and water pollution, inadequate sanitation, and poor solid waste management are the poor. Poor people are also the group of citizens that are most affected by desertification, floods, storms, earthquake disasters, and harvest failures. In certain circumstances, the poor people and environmental damage are caught in a downward spiral, i.e., past resource degradation deepens today's poverty, while today's poverty makes it very hard to care for or restore the vitality and the carrying capacity of the ecosystems.

In such circumstances, it is very hard to restore land resource base, to find alternatives to deforestation to prevent desertification, to control erosion, and to replenish soil nutrients. Because, people in poverty are forced to deplete resources to survive, a process that further impoverishes them (Fukuda-Parr and Shiva, 2003). When this self-reinforcing downward spiral

peaks, poor people are forced to move in increasing numbers to other ecologically fragile lands of the country. Such was the case of displacements of tens of thousands of poor people from the provinces of Badghis and Ghor during the recent years of drought to the barren lands of Herat; or the displacements of tens of thousands of people from Nimrooz and Farah provinces, which are ecologically extremely poor and fragile parts of Afghanistan, in the aftermath of the sandstorms of 2002 and 2003 (IRIN, 2003), respectively.

Poverty is often simply considered to be a cause of environmental decline, however, the causal relationships are very complex. Poverty is more often a result of environmental degradation that can reach to a point of no return, after which poverty and social instability are inevitable. Also some evidence exists that poverty and inequity are driving factors in creating environmental degradation. This case is particularly noticeable in rural areas, where poverty in combination with a lack of economic and social policies, could force peasants to exploit land resources in unsustainable ways, resulting in further land degradation, deforestation, biodiversity loss, and water shortages.

As far as the poor people have limited access to natural resources, as the environment degrades, their share of access to the resources further shrinks. Consequently, in most cases, it is the poor who are the first to suffer. Such an "environmental poverty" further contributes to economic poverty and increased inequity in the society.

1.5. Environment and Gender:

Men and women are exposed to different environmental stresses and in different ways. Their work environment often differs, a fact that may have considerable health consequences. In poor societies, such as in Afghanistan, women are more exposed to high levels of indoor air pollution due to the fact that they spend more time at home, working in the kitchen. These women are doubly affected by environmental deterioration, first because of poverty, and second because of their role and status in their traditional patriarchal society. In such a setting, environmental degradation places a disproportionate burden on women, largely because of their social and economic roles, which expose them to a greater number of environmental hazards (WRI, 1996).

Traditionally the Afghan women have primary responsibility for household chores, activities that keep them inside the house for most of the time, if they get a chance to venture out at all. As they prepare food for the household, they are often exposed to high levels of smoke for long periods of time. No wonder that the life expectancy of Afghan women is lesser than that of the Afghan men.

Afghan women also bear the responsibility of washing the family's clothes. As far as the inadequate washing mechanism and facilities, poor sanitation, and contaminated water supplies in the country are concerned, this activity could pose serious health hazards to the women. Furthermore, the women are usually responsible for caring for the sick children and elderly, which in turn increases their exposure to disease-causing pathogens.

Among the Afghan women, particularly the women in nomadic communities take the primary responsibility for obtaining water that in many cases requires walking considerable distances from

the campsites. Milking, processing of animal products, caring for the sick livestock, weaving tents, moving residential properties, and many other house chores are also their responsibilities. In the poor households of rural Afghanistan, women have the responsibility of collecting fuelwood and cow dung to meet the family's energy needs. In an environmentally poor and degraded land, that means long hours of walking to collect fuel.

These activities significantly reduce women's time for other activities that they inspire, as well as exposing them to health risks that the men does not get exposed to, or not being exposed in this frequency. Moreover, girls often help their mothers in house chores, depriving them of valuable time for education. Not only these, but physiological factors also play a part in making women's health more vulnerable to environmental elements. Women are particularly at risk during pregnancy and after childbirth, when they are more vulnerable to such diseases as malaria (WRI, 1996). Thus, environmental issues could not be addressed adequately without an emphasis on gender equality.

1.6. Functioning Literacy and Environmental Awareness:
Public awareness of the condition of the environment, and of the social and economic impacts of environmental degradation has probably been the most important driving force for environmental improvement, worldwide. An informed and aware population, and a diversified and well-educated cadre of environmental experts are essential conditions for environmental improvements in any country.

Functioning illiteracy and educational poverty in the society can also be a factor in contributing to environmental degradation and further impoverishment. For example, farmers who out of ignorance inappropriately use pesticides and fertilizers can inadvertently harm themselves, their families, and the soils and water on which they depend. Once their ecological balance is disturbed, it takes lots of resources to restore that balance again, and consequently drives them further into the abyss of poverty and inequity.

In other countries, it is usually the public, supported by well-informed and articulate experts, not the government, and certainly not businesses that have put the environment on the agenda. In Afghanistan no environmental education exists at the primary, secondary or university levels. Public understanding of the links between environmental degradation, health and human livelihoods is very low.

To tackle this problem, adequate policy measures and awareness campaigns have to be implemented at national and provincial levels and in the communities. There is a need to incorporate basic environmental education into the primary and secondary school curriculum. At the same time universities in Afghanistan must adopt appropriate undergraduate environmental programs tailored to the needs of Afghanistan, to fill the gap and deficiency in environmental expertise of the country, and set the stage for the appearance of an informed environmental cadre.

Until then, it is the media that can raise important environmental issues and inform the public of consequences. One result of increased environmental awareness campaigns could be that it will

spurs people on to protect the environment and their own health and welfare. The ministry of irrigation, water resources and environment (MIWRE), in the capacity of the only national environmental agency of the country, bears the foremost responsibility in designing and implementing adequate policy and campaigns to fill the present gap of the functioning literacy and environmental awareness that exist in Afghanistan.

II. Afghanistan: A Land With a Diversity of Landscapes

2.1. A Historical Perspective of Environmental Change:

Afghanistan is a land of substantial ecological diversity and extremes. Archaeological studies revealed that at least until 2000 BCE, the territory of today's Afghanistan was partially covered with cedar-rich forests (Ponting, 1990). Today's mountains, rivers, forests, farmlands and pastures are the backbone of the ecosystems and economy of the country, providing the inhabitants of Afghanistan with all the life supporting necessities. These interwoven ecosystems are so dependable on each other that a minor damage to any of them, would cause a chain of damages to follow, leading to the degradation of the whole system that destroys within itself the supporting pillars of the economy and social structure of the country.

Historically, environmental changes in Afghanistan have occurred in a very slow pace. Most of environmental changes are noticeable only in time spans of tens of years, or in a century; all in the form of gradual changes of the land surface and topography, forest and vegetation cover, wildlife patterns, water channel systems, air quality, climatic changes, etc., so they mostly remain obscure from the eyes of the public. Due to this gradual nature of these changes, and the prevalent functional illiteracy in the country, the consequences of environmental degradation is not understandable and of serious concern to most citizens of Afghanistan.

However, the situation is gradually changing. During the recent war, some environmental changes revealed themselves in an explosive manner and in a very short time span. This gave to the notion that the war has to be blamed for the deterioration of environment, the poor productivity of the farmlands and other land-based resources, and finally the collapse of the social and economical structure of the country. This notion substantially neglects the negative impacts of the environmental scarcity and its consequences that occurred in the past, because of their gradual nature. Thus, by mere ignorance, Afghans have not tried seriously to dig into other causes of their failure to sustain a peaceful society and a prosperous lifestyle. Another cause of failure to understand the extent of the crisis may be due to the fact that they present generations of Afghans have not paid as much toll to the environmental surprises (Holling, 1986), as to the overwhelming amount paid for the war. Such ignorance by itself is a tragedy that has to be tackled.

2.2. Mountain and Desert Ecosystems:

Most of the total area of Afghanistan (some 63 per cent) is mountainous, from which more than a quarter (27 per cent) lies above 2500m from sea level (Kapos, et al., 2000). Rising to about 5100m, the rugged Hindu Kush range, covering 456000 km2 from the total area 651000km2, forms the central core of the country, from where ridges fan out to the west and south, with the Parapamisus Mountains extending westward up to the border with Iran. The Hindu Kush rises

further in elevation northeastward, to around 7000m in the high-altitude Wakhan Corridor, where the Pamir and Karakoram joins.

In all these mountains, there is no or little vegetation, which is typical of an arid region. Except for the Solaiman ranges to the south and south eastern flanks of the country that support dense vegetation due to partial receiving of precipitation emanating from the Indian subcontinent's annual monsoons, the rest of the Hindu Kush, especially the north and north-western extensions support either sporadic vegetation of trees and shrubs or are bare rocky mountains and hills with very sparse vegetation.

In most of the valleys of Hindu Kush, the vegetation in the low and medium altitudes makes the livelihoods of the inhabitants, and in some cases the only resource for the continuation of life, thus it plays a vital role in the overall health of the society's coexistence with the harsh nature of the land. For example, if we consider the importance of pistachio nut (*Pistacia vera*, yielding) among hundreds of other floras that grow in the north and north-western extensions of the Hindu Kush, we find out that it does not only provide climatic and environmental stabilisation over the areas of its growth, but ease the life of thousands of families by means of providing them a natural-based source of income to sustain their livelihoods.

Half of the remaining one-third of the country's landscape is composed of deserts, which are very hostile environments, at least in the context of supporting human habitation. However to some extent, this ecosystem act as one of the supporting pillars of the traditional nomadic way of life for more than a million kuchi citizens of Afghanistan.

2.3. Farmlands and Pastures:

The other half of the one-third of the lowland of Afghanistan is composed of farmlands and pastures, on which the whole livelihoods of the inhabitants depend. At present, as suggested by Future Harvest (FHCRAA, 2002), about 3.3 million ha (5 per cent of the total land area) is irrigated and regularly cropped, while 4.5 million ha (7 per cent) is rain-fed and is cropped opportunistically, depending on precipitation.

Most of the rain-fed land lies in a long belt lying west to east along the northern foothills and plains. Increasing rural population pressure on available land over the last two to three generations has led to more and more traditional grazing land being cultivated for rain-fed wheat crops, even on very steep slopes and in the highest mountains. Wheat is the main crop cultivated on both irrigated and rain-fed land throughout the country, reflecting Afghanistan's cultural dependence on bread as the staple diet, as on average, per capital consumption of wheat is 167 kg per year (UNEP, 2003).

From 1975 to 2000, the area of agricultural land is drastically decreased. Although there is no precise data available, but if we relate the net loss of agricultural products to the loss of agricultural land, we reach to an average annual loss of 3.5% of net agricultural products since 1978 (Department of State Dispatch, 1994); if we consider some of this decrease to be caused by temporary degradation of land or loss of harvest due to social turmoil in the country, still we reach

Environment and Human Development in Afghanistan

(Background Paper for NHDR-Afghanistan)

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